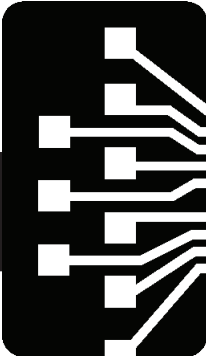


ELEC

Electrical and Computer Engineering

WEB LINKS	https://ece.rice.edu/
FRANK ADVICE	Start with MATH, CHEM, PHYS, and COMP requirements to get a solid background. Some of the sophomore core ELEC courses may be taken freshman year, such as ELEC 220, but often ELEC 241, 242, and 261 are best taken in the sophomore year. See the ECE department undergraduate web page and the IEEE student branch handbook at http://ieee.rice.edu/ for additional sample degree plans.
ADVICE FOR STUDENTS WITH AP CREDIT	ELEC 220, ELEC 241, ELEC 242, and ELEC 261 are introductory core courses. Many students take ELEC 261 or ELEC 220 in freshman year, but depending on one's math background, ELEC 241 and ELEC 242 may be better taken in the sophomore year.
ALTERNATIVE CURRICULA	ECE has four specialization areas: computer engineering (CE); data science/systems (DS/SYS); neuroengineering (NEURO); and photonics, electronics and nanodevices (PEN). CE focuses on hardware design within computer systems, covering computer architecture, security and storage. DS/SYS seeks to extract meaningful, actionable information from diverse data sources. Applications include wireless communications, digital signal processing, computer vision and networking. NEURO seeks to understand and manipulate neural networks, as well as treat diseases and disorders. PEN seeks to more fully understand the interaction of light and matter and apply that knowledge to develop novel devices and technologies.
BS VERSUS BA	ECE offers the traditional B.S.E.E. degree for students interested in engineering careers. The program leading to the B.S.E.E. is accredited by the Engineering Accreditation Commission (EAC) of ABET, www.abet.org . The program leading to the BA degree is not accredited by the EAC of ABET and is often pursued by students as a component of a double major or dual degree program.
NOT REQUIRED BUT HIGHLY RECOMMENDED COURSES	ELEC 262 Introduction to Waves and Photonics ELEC 342 Analog Electronic Circuits ELEC 447 Introduction to Computer Vision



<p>RESEARCH</p>	<p>There are many opportunities for undergraduate independent and team research in ECE, including ELEC 490: Undergraduate Research Projects. Several faculty have started the Large Scale Integrated Projects program (VIP) open to all levels. Summer research opportunities are available through Research Experiences for Undergraduates (REU). Contact faculty directly for more information. ECE has a Corporate Affiliates program (ececad.rice.edu), and encourages students to attend the annual event held in spring to meet informally with member companies.</p>
<p>INTERNSHIPS AND STUDY ABROAD</p>	<p>There are many opportunities in electrical and computer engineering for study abroad and international internships, including through the Nakatani RIES program. See nakatani-ries.rice.edu.</p>
<p>PROFESSIONAL ORGANIZATIONS</p>	<p>The Institute for Electrical and Electronics Engineers (IEEE) has an active student chapter and an Eta Kappa Nu honor society at Rice. See ieee.rice.edu for details on the Friday lunch talk schedule. The IEEE student chapter co-presidents for 2018-2019 are Fasai Phuathavornskul (fasai.phuathavornskul@rice.edu) and Jonathan Bunt (bunt@rice.edu). Also, the ECE Department has an active colloquium series, with many events co-sponsored by IEEE Houston chapters chaired by ECE faculty.</p>
<p>INTERESTING COURSES FOR NON-MAJORS</p>	<p>ELEC 220 Fundamentals of Computer Engineering ELEC 243 Electronic Measurement Systems ELEC 261 Electronic Materials and Quantum Devices</p>

B.S. In Electrical Engineering

Specialization Areas: Computer engineering
 Data science/Systems
 Neuroengineering
 Photonics, electronics, and nano-devices

Sample Degree Plan

THIS IS ONE EXAMPLE OF MANY POSSIBLE SCHEDULES.
 CONSULT A DIVISIONAL OR DEPARTMENTAL ADVISER TO CUSTOMIZE YOUR DEGREE PLAN.

FALL			SPRING		
FRESHMAN 18 credits			FRESHMAN 17 credits		
CHEM 121	General Chemistry I w/Lab	4	ELEC 220	Fund of Computer Engineering	4
COMP 140*	Computational Thinking	4	MATH 102	Single Variable Calculus II	3
MATH 101	Single Variable Calculus I	3	or 106		
PHYS 101	Mechanics w/Lab	4	PHYS 102	Electricity & Magnetism w/Lab	4
FWIS	Freshman Writing	3	DIST	Distribution elective	3
			OPEN	Open Elective	3
SOPHOMORE 16 credits			SOPHOMORE 16 credits		
ELEC 240	Fund of Elec Engr I Lab	1	CAAM 335	Matrix Analysis	3
ELEC 241	Fund of Elec Engineering I	3	or MATH 355		
ELEC 261	Electronic Mat & Quantum Devices	3	ELEC 242	Fund of Electrical Engineering II	3
MATH 212	Multivariable Calculus	3	ELEC 244	Fund of Electrical Engr II Lab	1
DIST	Distribution elective	3	ELEC 305	Intro to Physical Electronics	3
OPEN	Open Elective	3	ELEC**	ECE math and science elective	3
			DIST	Distribution elective	3
JUNIOR 16 credits			JUNIOR 18 credits		
ELEC 301	Introduction to Signals	3	ELEC	ECE Design Lab elective	3
ELEC 303	Random Signals	3	SPEC	Specialization elective	3
ELEC 326	Digital Logic Design	3	SPEC	Specialization elective	3
OPEN	Open elective	3	DIST	Distribution elective	3
OPEN	Open elective	3	OPEN	Open elective	3
LPAP	Lifetime Phys Activity elective	1	OPEN	Open elective	3
SENIOR 18 credits			SENIOR 15 credits		
ELEC 494	ECE Senior Design	3	ELEC 494	ECE Senior Design	3
SPEC	ECE specialization elective	3	SPEC	ECE specialization elective	3
SPEC	ECE specialization elective	3	SPEC	ECE specialization elective	3
DIST	Distribution elective	3	DIST	Distribution elective	3
OPEN	Open elective	3	OPEN	Open elective	3
OPEN	Open elective	3			

* Comp 140 in the fall followed by COMP 182 in the spring of freshman year is strongly recommended for Computer Engineering

**Typically approved courses: BIOC 201, CAAM 336, CAAM 378, CHEM 122/124, MATH 211, and MATH 222

BASIC REQUIREMENTS	General math & science courses	33
	Core courses in major	34
ELECTIVE REQUIREMENTS	Engineering specialization electives	18–24
	Open electives and LPAP	22–28
	FWIS and distribution courses	21
Minimum credit required for the B.S.		134

Of the 134 total degree credits, the B.S. in Electrical Engineering requires at least 85 credits in general math and science courses, core courses including the design lab and senior design, and specialization electives.

Major Requirements

NUMBER	CREDIT	TITLE
CHEM 121	4	General Chemistry I w/Lab
COMP 140*	4	Computational Thinking/Intro to Engineering Computation
ELEC**	3	ECE Math and Science elective
ELEC 220	4	Fundamentals of Computer Engineering
ELEC 241	4	Fundamentals of Electrical Engineering I
ELEC 242	4	Fundamentals of Electrical Engineering II
ELEC 261 or PHYS 202	3	Electronic Materials & Quantum Devices/Modern Physics
ELEC 301	3	Introduction to Signals
ELEC 303	3	Random Signals
ELEC 305	3	Introduction to Physical Electronics
ELEC 326	3	Digital Logic Design
ELEC 494 (x2)	4	Senior Design
ELEC 327/332/364	3	ECE Design Lab elective
MATH 101/105	3	Single Variable Calculus I /AP or Other Credit Calculus I
MATH 102/106	3	Single Variable Calculus II /AP or Other Credit Calculus II
MATH 212 or 221	3	Multivariable Calculus/Honors Calculus III
MATH 354/ MATH 355 or CAAM 335	3–4	Honors Linear Algebra/ Linear Algebra or Matrix Analysis
PHYS 101/111	3	Mechanics w/Lab
PHYS 102/112	4	Electricity and Magnetism w/Lab
SPEC	3–4	ECE Specialization elective
SPEC	3–4	ECE Specialization elective
SPEC	3–4	ECE Specialization elective
SPEC	3–4	ECE Specialization elective
SPEC	3–4	ECE Specialization elective
SPEC	3–4	ECE Specialization elective

* *Comp 140 in the fall followed by COMP 182 in the spring of freshman year is strongly recommended for Computer Engineering*

***Typically approved courses: BIOC 201, CAAM 336, CAAM 378, CHEM 122/124, MATH 211, and MATH 222.*